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ILLUSTRATION BY PHILIP MCCALL

Just 12 minutes after he was hit, Capt. Dutton slugged his damaged Thunderjet along the runway, while Air Force fire fighters and medical personnel rushed to help him.

The student pilot's bullets missed the target, and instead plowed into Captain Richard Durkee's plane—and into Durkee. New, blinded and bleeding to death, Durkee groped toward Luke AFB, and a man he'd never met flew off his wing, desperately cooing him in. "How about my landing gear?" asked Durkee. His wingman replied . . .

"Belly it in!"

By JOSEPH STOCKER

AT APPROXIMATELY eight o'clock on the morning of May 31, 1955, F-4 student pilot from Luke Air Force Base, Arizona, pressed the gas button on his control stick. From the stubby nose of his F-4 Phantom II fighter-bomber poured a deadly cascade of .50-caliber machine-gun fire.

He was aiming at a low target 12,600 feet above the empty desert waste of southwestern Arizona. But he missed the target. His bullets, instead, smashed squarely into another jet plane which, just as that moment, had whirled into his line of fire from his blind spot below and ahead of him. It was, as an investigation subsequently established beyond the slightest question, an accident, and a very unusual type of accident at that. Jet pilots ordinarily shoot other jet pilots only when there is a war on.

Well, accidents happen. Jet crashes, after all, is no hazardous trade in scientific man has devised. And, in preparing himself for his trade, the jet pilot must incur an irremediable measure of hazard, the loss of training in warlike.

Accordingly, this particular accident might have been filed and forgotten—except for what occurred on the 12 tense and terrible minutes immediately following. During those minutes, monumental courage was demonstrated by one man and monumental presence of mind by . . . (Continued on page 18)

Months later, spaced pilot (L) met Lt. H. J. Browning, who'd saved him.

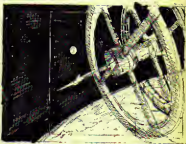


SINCE THE OUTBREAK of war in Korea, America has been working against time to build up its Air Power. Only our military leaders and Congress can decide how much Air Power we should have at any given time. Yet, as a leading manufacturer, we feel a responsibility to help you understand the vast complexity of modern aircraft . . . and why a "happy medium" level of production must be maintained in peace so that we can expand quickly to meet emergencies. Second-best Air Power is not enough in war. America's future security demands a long-range Air Power program in peace as well as in emergency.

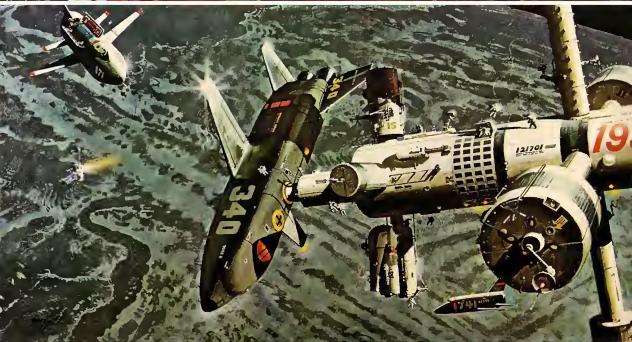


POTENT NORTH AMERICAN AJ "SAVAGE," POWERED BY TWO PRATT & WHITNEY PISTON ENGINES AND ONE JET, HAS MORE REACH THAN ANY OTHER CARRIER-BASED PLANE.













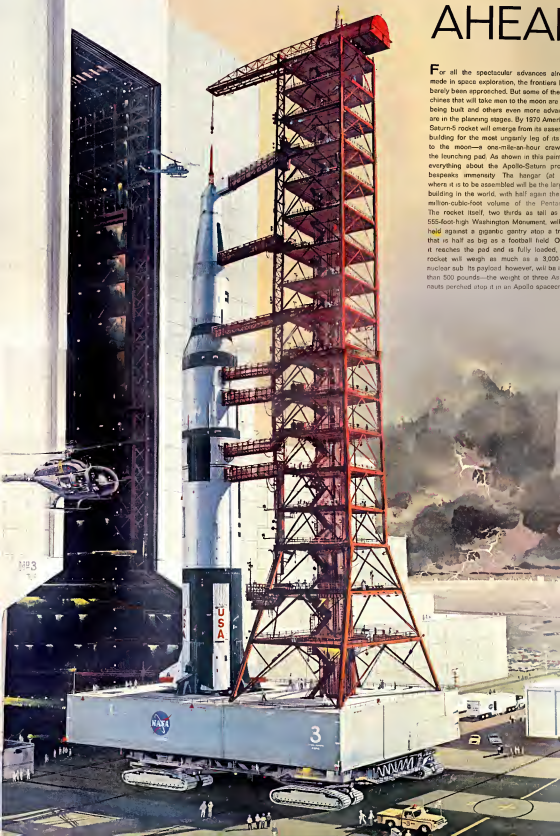






WHAT LOOMS AHEAD

For all the spectacular advances aimed at space exploration, the frontiers have barely been approached. But some of the challenges that will take men to the moon are being built and others even more advanced are in the planning stages. By 1970 America's Saturn-5 rocket will emerge from its essential building for the most ungainly leg of its journey to the moon—a one-mile-an-hour crawl on the launching pad. As shown in this painting, everything about the Apollo-Saturn project bespeaks immensity. The hangar (at right) where it is to be assembled will be the largest building in the world, with half again the million-cubic-foot volume of the Pentagon. The rocket itself, two thirds as tall as the 555-foot-high Washington Monument, will be held against a gigantic gantry atop a train that is half as big as a football field. Once it reaches the pad and is fully loaded, the rocket will weigh as much as a 3,000-ton nuclear sub. Its payload, however, will be less than 500 pounds—the weight of three astronauts perched atop it in an Apollo spacecraft.

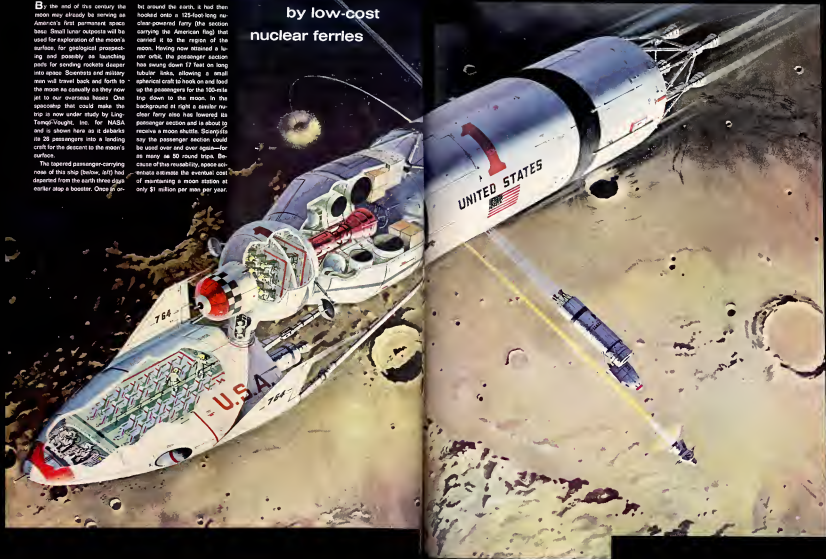


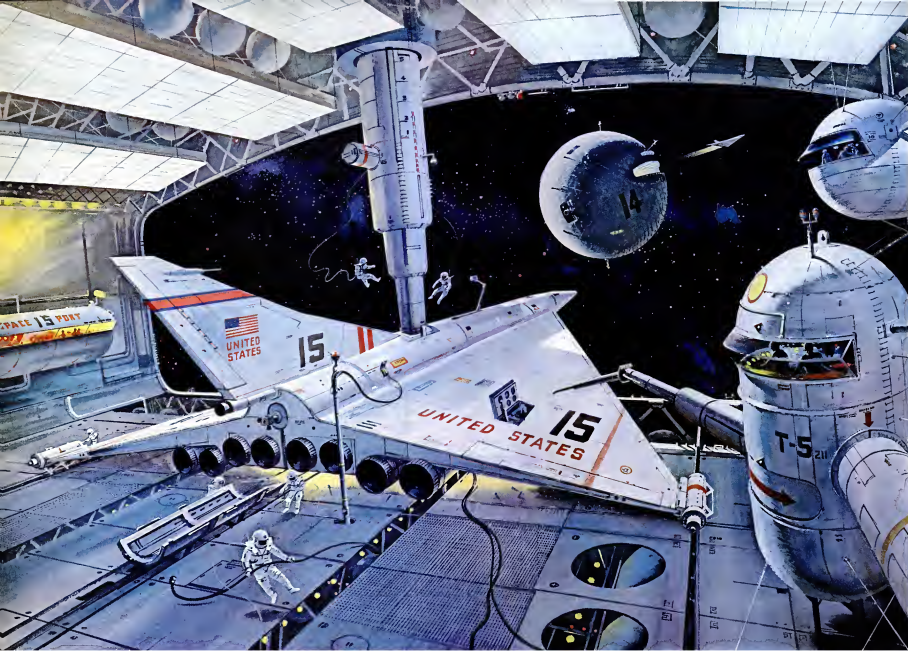
By the end of this century the moon may already be serving as America's first permanent space base. Small lunar outposts will be used for exploration of the moon's surface, for geological prospecting and possibly as launching pads for sending rockets deeper into space. Scientists and military men will travel back and forth to the moon as casually as they now jet to our overseas bases. One speculator that could make this trip is now under study by Ling-Temco-Vought, Inc. for NASA and is shown here as it docks its 26 passengers into a landing craft for the descent to the moon's surface.

The tapered passenger-carrying nose of this ship (below, left) had descended from the earth three days earlier atop a booster. Once in or-

bit around the earth, it had then hooked onto a 125-foot-long nuclear-powered ferry (the section carrying the American flag) that carried it to the region of the moon. Having now attained a lunar orbit, the passenger section has swung down 17 feet on long tubular links, allowing a metal spherical craft to hook on and load up the passengers for the 100-mile trip down to the moon. In the background at right a smaller nuclear ferry also has lowered its passenger section and is about to receive a moon shuttle. Scientists say the passenger section could be used over and over again—for as many as 50 round trips. Because of this reusability, space scientists estimate the eventual cost of maintaining a moon station at only \$1 million per year per year.

by low-cost nuclear ferries





Way-station for men bound for the planets

Just as the air age created the need for air terminals, the age of space travel will require the establishment of manned space stations, and thought is already being given to possible designs. In four decades, space stations—possibly like those shown here—may be in orbit around the earth and serving a variety of purposes. They could be used as weather stations, astronomical observatories, supply points for military space bases, data collection centers for unmanned satellites, even as centers of medical research to investigate the effects of weightlessness on disease. Diplomats reluctant to meet on each other's home ground could travel within minutes to neutral man-made terrain high above the earth and its disorders.

But the space station's most practical and perhaps most valuable function will be as a launch platform for interplanetary spacecraft. A hydrogen-fueled shuttle ship like the one seen here could rocket up from the earth, back into the station's hanger and discharge passengers through a telescoping airlock into an overhead waiting room. Men in space suits would swim around like a ground crew while the vehicle loads up from a fueling tower (right, foreground) and the passengers wait for the connecting flight to Mars.

Exploring on Mars, half a year from home

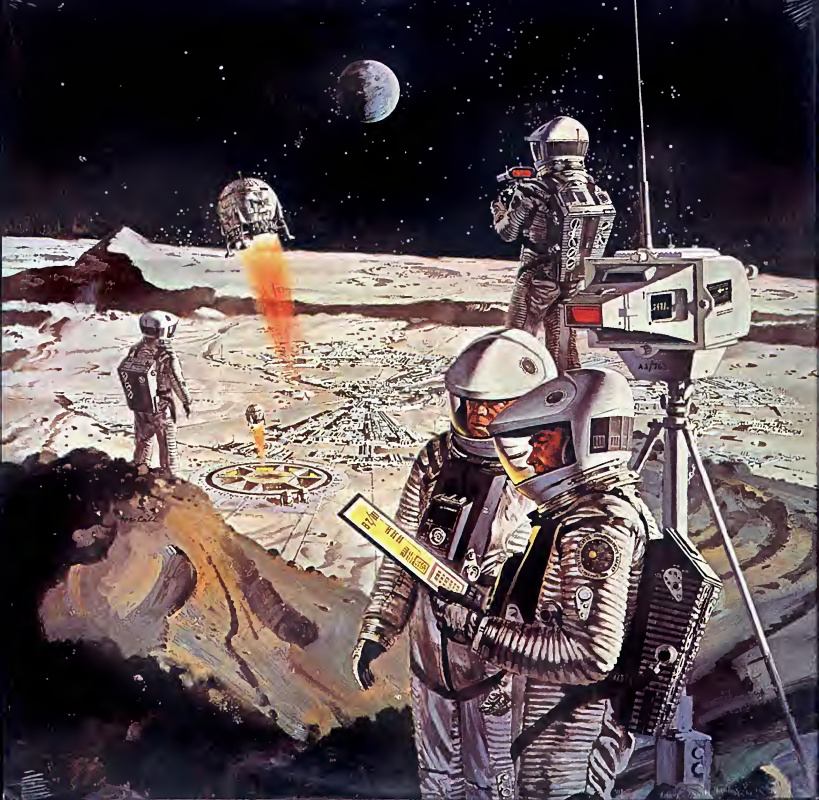
Within the next few weeks NASA plans to launch two photoreconnaissance vehicles on a trajectory that will take them close to Mars eight months later. Hopefully they will send back data indicating that a manned flight to the planet would be feasible, perhaps within the next two decades.

When and if man do attempt the trip, they may aim for the edge of one of the vast flat desert areas believed to exist on Mars. In this painting the Astronauts—wearing suits designed for a landing on the moon—have established a Mars base camp. They have set up inflatable igloo-shaped shelters (lower left and right) with materials brought in their capsule, and they communicate with earth on radio waves beamed from parabolic antennas. Gas jets strapped to their backs help them get around.

When it is time to leave, the three-man teams will climb back into their arrival vehicle and fire themselves into a Mars orbit where they will rendezvous with a parent ship for the six-month journey back to earth.

Most scientists believe that if life exists on Mars, it is very primitive, perhaps a kind of lichen-like plant. But no one rules out the possibility of surprises. A study made for NASA of possible Mars landing systems by Philco's Aerotronic Division touches on that possibility. "In the event higher animal forms are encountered, it will be desirable to trap living specimens. They will probably tend to be elusive, however, and photographs or casts of surface imprints may have to suffice."













BUILDING A SPACE STATION

BUILDING A SPACE STATION
Under the supervision of two flying aerospace engineers, a space shuttle's manipulator arm unfolded a prefabricated section to add on to the existing space station, at last. Powered by air jet pumps, the station's own manipulator arms attach another section from a second shuttle.

LIFE

INTERNATIONAL

RUSSIA'S FEAT Where It Leaves U.S. in the Race to the Moon

ALSO IN
THIS ISSUE

Report on
U.S. Economy

The masterpieces
of Andrea Mantegna

Genesis of 'The Power and
the Glory'—by Graham Greene

ILLUSTRATION OF THE TWO
SOVIET CAPSULES IN ORBIT
AS THE SUN RISES OVER THE EARTH

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MONTHLY



SHIP NAME
PLAZA &
GARDEN

The Missile Ships We're Building

PAGE 120



A towering needle spewing out flame

A soaring symbol of the space age, the city's 600-foot Space Needle is crowned by steel legs and flares with a 40-foot jet of natural gas. In the background, right, Mount Rainier. Transparent-walled elevators will transport passengers to the observation deck. Below the deck, a constantly revolving restaurant makes a full circle every hour. After the fair, the Needle will stand as a permanent Seattle landmark.

POULD OUT, DO NOT TEAR



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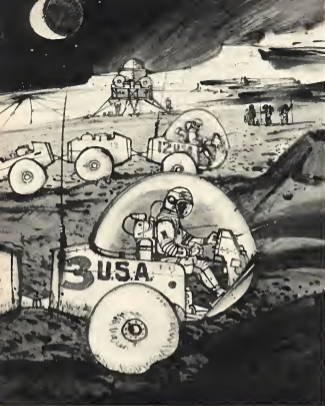
OVER 2,200,000 CIRCULATION



THE SUNJAMMER

SCIENCE-FICTION NOVELETTE—Page 15

McCall



rimmed craters, desertlike "seas," and deep, powdery dust. The astronauts and their equipment, in the low pressure lunar gravity, will weigh only one-sixth of what they do on earth, and it will be difficult to keep anchored to the ground. At the same time, six times as much weight can be lifted. Earth will appear to the men as their "moon."

In this harsh and hostile environment, these adventures of the century can exist outside their moonship only in their space suits, which will create their own atmosphere and protect them from the temperatures, radiation and pelting meteorites. Gas jets strapped to their backs will help them get around, but not for any great distances. Limited oxygen supplies will limit the astronauts to an area of a few hundred yards surrounding their space machine.

These first lunar explorers will spend only a few hours on the moon—certainly not more than one day and one night as we know it on earth—as opposed to a lunar "day," which can take from two weeks to six months, because the moon rotates so slowly. Then they will start their three-and-a-quarter day trip back to earth in the same vehicle in which they arrived.

For extended visits and explorations, specialized living quarters and extraordinary vehicles will be necessary to cover the vast lunar surfaces,

which are almost as large as the North and South American continents together. These vehicles cannot be propelled by air-breathing motors, but will depend on solar cells or nuclear reactors. They will operate from a large battlement home-base vehicle, which will provide living quarters and protection for six men for periods as long as three months, along with communications and scientific facilities.

The moon will almost certainly be manned by the early 1970s. A few years after that, the flat desert areas believed to exist on Mars—six months' space travel away from earth—are expected to be reached. Of the eight planets in our own solar system, not counting the earth, space scientists think that Mars is the place where the probability of life is the greatest, most likely in the form of mosslike growths, as well as bacteria and viruses. Advanced moon equipment will bare their secrets.

On these pages, space artist Robert McGill vividly depicts some of the tools and the basic ways that man plans to probe the planets.

The proposed four-track lunar mobile laboratory (page 71) will allow two men to spend 14 days exploring over 250 miles of the moon's surface. The 80-inch-diameter wheels, folded into the side of the mobile lab in the

lunar terrain. Both the tracks and the wheels will be lowered like the landing gear of a plane after arriving on the moon. These lunar rovers will be delivered to the moon months ahead of their two-man crews, unloaded and tested by remote control. The scientist-explorers to operate them will arrive by larger spaceship. Transfer will be made in pressure suits, like that worn by the astronaut in the foreground. Inside the mobile lab's sealed cabin, the men will be shielded from radiation and other hazards. Observations will be made with remotely controlled "arms" and "hands," through screens, windows and periscopes, and with stereo TV cameras. Power will be by hydrogen-oxygen fuel cells and radiation. Such machines are expected to be on the moon in the mid-1970s.

(Left above.) By the 1980s man is expected to land on Mars. First explorations will be short trips away from the nuclear-powered spacehips, shown in the background, which will carry the solar scientists from earth, a neighboring planet or an orbiting way station. Temperatures on Mars are not believed to be as extreme as those on the moon, but the atmosphere is probably a near-vacuum and the radiation is heavy. Unlike the moon, the surface of Mars is thought to be largely flat. Space suits worn

by the first Mars men will be propelled by gas jets strapped on the back.

Flying platforms (center above) are envisioned as a means of transporting lunar explorers over the moon's surface at rapid speeds. Stowed-on machines would relieve astronauts of the weight and bulkiness of back-mounted systems on their space suits. Extra fuel tanks could extend the vehicle's range. This type machine is being considered for use by the first men to land on the moon in our Apollo capsule. In an emergency this lunar transporter could be used to transfer men from one craft to another in a space-rescue effort. On the moon men using this vehicle could stay away from their Apollo spacecraft for as long as 48 hours.

(Right above.) This proposed "moon jeep" would carry two men. It would be delivered in an unmanned cargo carrier, to be used as needed. By 1990 such vehicles are expected to be used as taxis and trucks between the several research centers set up then on the moon at widely spaced locations. A shuttle service from earth will supply the main stations and these jeeps will feed the more remote and smaller locations, along the lines of the setup in operation in Antarctica today.

SPACE VEHICLES

BY JAMES WINCHESTER

ILLUSTRATED BY BOB McCALL

One day soon there will be the first footprint on the pockmarked, airless surface of the moon. For man to live and explore on this lifeless planet, as well as to establish a home in the rest of the solar system, we must have totally new concepts of existence and working tools.

It's going to take a rocket two-thirds as tall as the Washington Monument and weighing as much as a nuclear submarine to land the first three astronauts in their Apollo spacecraft on the moon. The air will be too thin to breathe. Temperatures will fall as fast as a shadow, ranging from 214 degrees Fahrenheit above zero to 250 degrees below. The moon has no weather as we know it on earth, no wind, rain or snow. The landscape is colorless, filled with rock-





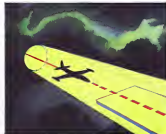


Winn


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Pigmy Co-Pilot!

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2. **An Air Force General** has called the tiny pilot the core of the air defense of America! Thus, electronic engineers have contributed to the protection of your home. In quite another way, petroleum engineers have contributed to the protection of your car, by developing Conoco Super, the new motor oil that fights winter's rasping wear.



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Driving Test —
10,000 Miles in
a Ford Falcon

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Build Your Own
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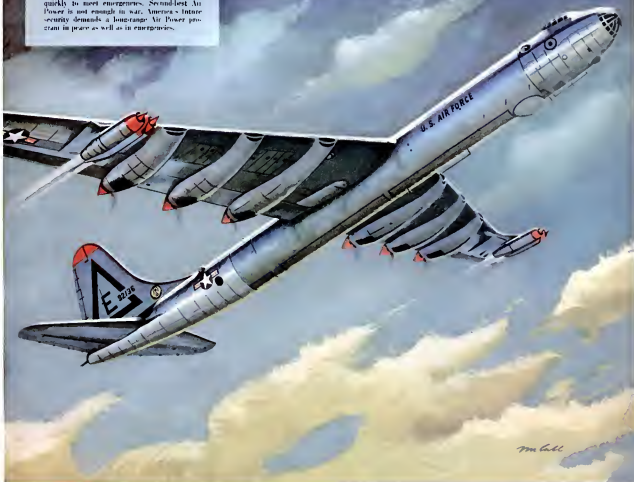
The Truth About
Truth Serum

PAGE 106



McGill

SINCE THE OUTBREAK of war in Korea, America has been working against time to build up its Air Power. Only our military leaders and Congress can decide how much Air Power we should have at any given time. Yet, as a leading manufacturer, we feel a responsibility to help you understand the vast complexity of modern aircraft . . . and why a "happy medium" level of production must be maintained in peace so that we can expand quickly to meet emergencies. Second-kest Air Power is not enough in war. America's future security demands a long-range Air Power program in peace as well as in emergencies.



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